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(54) Title: METHOD AND APPARATUS FOR COMMERCE ITEM INFORMATION HOMOGENIZATION IN ELECTRONIC COMMERCE SYSTEM

(57) Abstract: A system for use in an online merchant system which includes a system for homogenizing the format of received commerce item information from at least two distinct online entities, an aggregate database for storing the homogenized commerce item information, and a user interface that accesses the aggregate database for query and retrieval of competitive commerce item information from the online entities and displays it within a user's Web browser window. The system comprises a method and apparatus for associating a commerce item information tag with each separate unit of commerce item information that is received to the online merchant system, the commerce item information that is received to the online merchant system, the commerce item information tag enabling recording and reporting commerce metrics related to the commercial activity of a commerce item for sale through the online merchant system.

METHOD AND APPARATUS FOR COMMERCE ITEM INFORMATION HOMOGENIZATION IN ELECTRONIC COMMERCE SYSTEM

BACKGROUND OF THE INVENTION

The invention relates to a method and apparatus for homogenizing information related to goods or services sold through an online merchant system. The invention further relates to a method of tracking and reporting commerce metrics in an electronic commerce shopping and merchandising system.

DESCRIPTION OF THE RELATED ART

The World Wide Web ("Web") is part of a global computer network known as the Internet through which Online Service Providers ("OSPs") **1**, such as Microsoft Network, CompuServe, Prodigy and America Online, enable on-line users ("Users") of OSPs **1** to link to the Web. See FIG. 1. As a result Users may access the Web sites of a variety of online entities to retrieve a variety of content as well as purchase a variety of products and services from distinct online entities. Users may directly access the online merchant systems of distinct vendors **3** on the Web and also the online merchant systems of eCommerce Aggregators **4**. Online eCommerce aggregators **4** access, search and retrieve product information from various vendor databases to provide a comparison shopping mechanism for Users of the aggregator's **4** Web site.

A Web based online merchant system enables an online entity, such as a vendor **3** or aggregator **4**, to particularize the Web site pages that display and describe its product or services, *i.e.* "commerce items", to Users. The online entity determines the layout and display of Web site pages having descriptive content including text, images, sound and video. The general manner of creating Web site content using HyperText Markup Language (HTML) and delivering it to Web browsers is well known in the art. Users may access an online entity's merchant Web site using a Web browser, *e.g.* Netscape Navigator, installed on a client connected to the Web through an OSP **1**. The User's Web browser loads and interprets the HTML to format and display the online entity's Web page for the User's Web browser. An online merchant system may also provide a User interface, *e.g.* GUI, to enable shoppers to navigate a online entity's site and identify commerce items of interest, obtain specific information regarding commerce items, and to electronically purchase commerce items.

For the purpose of this application, a vendor **3** is considered to be any online entity that engages in commercial transactions involving commerce items. Vendors **3** typically store information , *i.e.* "commerce item information **33**", related to its commerce items such as product descriptions, specifications, prices and images, in relational databases. Relational databases are well known in the art and generally comprise a logical design structure , *i.e.* a schema, that defines the groupings, *e.g.* tables, of data, the distinguishing characteristics, *e.g.* attributes, of that data, and the relationships between different groupings of data in a vendor database **31**. Once the vendor's database schema is designed, the vendor **3** may use a database management system, also well known in the art, to

build and administer its database. Thus, vendors **3** typically create an internal proprietary schema to organize and manage their databases **31**.

Most commercially available online merchant systems require that vendors **3** organize vendor commerce item information **33** in databases **31** according to a predefined schema. Thus, because various vendors **3** organize their item information **33** according to proprietary database schemas, to use these systems a vendor **3** must either convert its existing database **31** to a different and predefined schema, or the vendor **3** must create a new database **31** having the predefined schema. Either option requires substantial efforts and costs which may indirectly force vendors **3** to compromise their database design and management. It follows that Users are less is likely to have a successful shopping experience while visiting the vendor's merchant Web site. Other vendors **3** may simply forego making their databases **31** available to Users because of the cost of implementing a high quality merchant Web site.

One potential solution is to standardize the format of communicated commerce item information **33** between online entities. Alternatively, a single online entity could provide and manage an aggregate database **32** that combines the commerce item information **33** from several distinct vendors **3**. However, since each vendor **3** has likely developed an internal proprietary database schema, it is likely that the commerce item information **33** from the distinct vendors **3** would have differing formats that will make the aggregate database **32** difficult to successfully build, manage, and search. Thus, it would be desirable to enable distinct vendors **3** to facilitate commercial transactions of their commerce items

through an aggregate database **32** by homogenizing the format of commerce item information **33** from distinct vendors **3**.

A potential drawback to the above proposed solution is loss of control over commerce metrics that measure the commercial activity related to a commerce item for sale through an online merchant system. Thus, it would also be desirable to provide a means of enabling a vendor **3** to retrieve commerce metrics related to the commerce items sold from an aggregate database **32** and an online merchant system.

SUMMARY OF THE INVENTION

A typical system implementing the invention includes both hardware and software systems within an online merchant system. Included in the hardware and software system are those components necessary to provide internet access between OSPs **1** and distinct vendors **3** of commerce items. Such Internet infrastructure hardware and software systems are readily available and their operation and design are obvious to those of ordinary skill in those arts.

Referring to FIG. 3, the invention enables OSPs **1** to improve a User's online shopping experience by improving the efficiency of a User's online shopping queries. One aspect of the invention comprises a homogenizing function **60** under control of the OSP **1** that standardizes the format of commerce item information **33** contained within data feeds **36** received from the distinct vendors **3**. The homogenizing function **60** further stores the homogenized commerce item

information **33** to an aggregate database **32**. The homogenizing function **60**, generally comprises a homogenizing system **62**, *i.e.* hardware under control of software, under management by the OSP **1** to receive and store the commerce item information **33** from distinct vendors **3** into the schema of the aggregate database **32** using a common format.

Another aspect of the invention associates a commerce item information tag **52** with the commerce item information **33** entered into the aggregate database **32**. The commerce item information tag **52** facilitates the gathering and reporting of commerce metrics related to the commercial activity of commerce item for sale through the online merchant system. Commerce metrics are considered to include or relate to the temporal, quantitative, or qualitative information regarding advertisement(s) of, and regarding database shopping "hits" retrieving commerce item information **33** from the aggregate database **32**. A further aspect of the invention comprises the local generation of such commerce item information tags **52** and the use of an advertising server **69** with the tags **52** for reporting and recording such database hits.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 depicts a block diagram of the Web illustrating the context within which an embodiment of the present invention is practicable, the OSP **1** is accessible by the distinct vendors **3** via a backbone network, *e.g.* Internet;

FIG. 2 depicts an embodiment of a methodology for generating product identifiers **50** including commerce item information tags **52**;

FIG. 3 depicts a simplified block diagram of an embodiment of the invention; and

FIG. 4 depicts a flow diagram of the homogenizing process according to the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The preferred embodiments of the invention are useful, for example, in an online merchant system. Referring to FIG. 3, a homogenizing function **60** standardizes the format of commerce item information **33** received from distinct vendors **3** into the online merchant system and further associates a commerce item information tag **52** with the received commerce item information **33** to enable the capture of metrics , *i.e.* "commerce metrics", related to the commercial activity of commerce items that are advertised and are for sale through the online merchant system.

In a first preferred embodiment, the homogenizing function **60** comprises a hardware and software homogenizing system **62**. The homogenizing system **62** standardizes the commerce item information **33** contained within the commerce item information data feeds **36** originating from the online merchant systems of a plurality of distinct online vendors **3**. The system **62** further initiates the storage of the commerce item information **33** in the aggregate database **32**. In a second embodiment (not shown), the homogenizing function **60** communicates and/or provides to vendors a preferred standardized format for data feeds **36** delivered from such distinct online entities. In either embodiment, the homogenizing function **60** further initiates the association of commerce item information tags **52**

with the commerce item information **33**, both stored to the aggregate database **32**.

In the first embodiment, commerce item information **33** contained within data feeds **36**, which originate from distinct online entities are routed to the homogenizing system **62** in a manner ordinary in the art for internet infrastructure systems. Thus, the homogenizing system **62** includes a communication function/application implementing an Internet Protocol stack. The system **62** may access the File Transfer Protocol (FTP) server located on each of the distinct vendors' merchant systems, or alternatively, the online entities may interface with the FTP server of the system **62** to initiate delivery of the data feeds **36**.

Each data feed **36** comprises a number of commerce item information elements **38** that are later combined by the homogenizing system **62** into distinct information packets **37**. Each commerce item information packet **37** relates to a commerce item for sale from the online vendor **3** and comprise such commerce item information elements **38** that collectively relate to the commerce item for sale.

It should be noted that examples of data feed and/or commerce item formats are Product Markup Language (PML) and XML.

In the preferred embodiment of the invention, because the formats of delivered commerce item information from the distinct vendors are contemplated to vary to some degree, the homogenizing system **62** comprises a parsing function **66** that detects a packet delimiter indicating breakpoints between commerce item

information packets **37**. Packet delimiter detection may comprise either the use of a standard packet delimiter or communication between the vendor **3** and OSP **1** as to the nature of the packet delimiter.

The homogenizing system **62** also comprises a mapping function/application **67** that writes the commerce item information to the aggregate database **32** according to the schema of the aggregate database **32**.

A preferred data homogenizing processes comprises two logical processes, and is described with reference to FIGS. 3 and 4. The first process is a matching process **51** that separates information packets **37** by primary categories and then applies a similarity search on the packets **37**. The similarity search involves comparing specific commerce item information from each commerce item to those within a database of known commerce items by using a set of weights and filters related to the commerce item category. A result of the matching process is each commerce item information packet **37** is augmented with resultant matching results.

The second process is a validation process **52** whereby each commerce item packet **37** is read and/or the associated database record representing the commerce item is read, and such associated database record of the aggregate database **32** is inserted, updated, or deleted.

One preferred aggregate database **32** schema comprises a hierarchical structure of categories of commerce items grouped according to consumer shopping expectations. In other words, the database schema associates related or

competitive commerce items within the aggregate database **32** such that a User's shopping query of the aggregate database **32** will return commerce item information **33** from distinct vendors **3** for competitive commerce items. FIG. 2 depicts an example of a hierarchical structure of entities representing commerce items.

The preferred homogenizing function **60** also generates and associates product identifiers ("PIDs") **50** with the commerce item information **33** stored in the aggregate database **32** according to a methodology that reflects both similarities and differences in commerce items. Thus, in an example methodology depicted in FIG. 2, PIDs **50** for two different commerce items, *e.g.* Models of dirt bikes from the same Maker, may have similar vendor item information **33**, and hence similar PIDs **50** comprised of like components, *e.g.* $\__n + \__n + \__n + \__n$, but also include a distinguishing PID **50** component *e.g.* $\__0$ or $\__1$. Further, it is preferable that at least a portion of the PID **50** is designated as a commerce item information tag **52**. That is, it should be appreciated that $\__1$ is a concatenation of corresponding items above it as shown in Fig. 2. Finally, while not preferred, it is contemplated that portions of a particular PID **50**, or the commerce item information tag **52**, be generated by separate business entities - such as by vendors **3**, aggregators **4**, and OSPs **1** - and combined to form the resultant PID **50**.

PID **50** and commerce item information tag **52** generation according to the preferred embodiment is preferably automatic and software controlled. In one embodiment, a sorting or filtering algorithm is implemented that parses vendor item information **33** from the vendor's data feed **36**, sorts that item information **33**,

and assign PIDs **50** and commerce item information tags **52** to each unit of vendor item information **33** stored into the aggregate database **32**. The preferred algorithm to generate PIDs **50** comprises a sorting or filtering function to detect similarities and differences between vendor item information **33** describing commerce items, a PID **50** generating function, and a PID **50** assignment function that associates the generated PIDs **50** and the respective vendor item information **33** within a database. Parsing and sorting algorithms are ordinary in the art and a person with ordinary skill in the art would be able to create a parsing and sorting algorithm according to the requirements disclosed herein.

The commerce item information tag **52** included together with the commerce item information **33** in the aggregate database **32** preferably comprises a unique sequence of elements, *e.g.* alpha numeric or binary sequence, that enables the capture and reporting of commerce metrics on the particular commerce item associated with the commerce item information tag **52**. Thus, the commerce item information tag **52** enables the recordation and reporting of commercial activity related to a commerce item. In the preferred embodiment, a reporting server **65** implemented either in software on the Web server or in a separate hardware/software system (see FIG. 3), detects and records aggregate database **32** queries retrieving commerce item information tags **52** thereby capturing commerce metrics reflecting the commercial activity of a commerce item. Moreover, because commerce item information tags **52** are traceable to the commerce item information **33** and the online entity originating the commerce item information **33**, detailed reports regarding particular commerce items may be generated. Each occurrence of a commerce metric of a particular commerce item, as indicated by a retrieval of associated commerce item information **33** from

the aggregate database **32**, initiates a recordation and reporting of the associated commerce item information tag **52** by the reporting server **65**.

Commerce metrics may be measured and recorded by the commerce item information tag **52** by software methods and/or functions that include; incremented counters, time-date stamping, and recordation of User Web navigation history. Moreover, commerce item information **33** and tags **52** may be retrieved from the aggregate database **32** by a User initiated event or a software initiated event. Thus, a User's shopping queries retrieving commerce item information **33** and tags **52** generates commerce metrics that can be captured by the reporting server **65**.

The reporting server **65** may thereafter be queried by the vendor **3** and/or the OSP **1** to generate reports regarding commerce metrics.

Additionally, an advertising application/server **69** may also generate and record commerce metrics of commerce item information elements, *e.g.* specs, price, images, may include advertising elements. Thus, commerce metrics are also generated as the advertising application/server **69** pulls commerce item information **33** and tags **52**.

It should be noted that in the preferred embodiment, a second tag that is invisible to the User is created when results from the User's query to the database **32** is displayed to the User's browser. This second tag contains an embedded request to the advertising server **69**. That is, as each displayed item in a query result is displayed on the User's browser, the second tag performs a unique request to the

advertising server **69** using the commerce item information **52**. The unique request to the advertising server also includes the query term that caused the query result to be displayed. Hence, the advertising server **69** reports the advertising request for each of the items, thus creating a record of each item displayed as a result of a query term. Rather than return an advertising image, the advertising server returns a small 1-by-1 pixel image that is invisible to the User.

It should be noted that several commerce metrics reports are enabled by the invention. Preferred recorded and reported commerce metrics related to commerce items include specific and general information regarding, but not limited to user shopping queries of the aggregate database **32** and tracking of commerce item advertisements on the online merchant system.

Although the invention has been described in detail with reference to particular preferred embodiments, persons possessing ordinary skill in the art to which this invention pertains will appreciate that various modifications and enhancements may be made without departing from the spirit and scope of the claims that follow.

CLAIMS

1. A method for facilitating online commercial transactions of commerce items for sale through an online merchant system, comprising the steps of:

homogenizing a plurality of commerce item information feeds delivered over a backbone network and originating from distinct online entities, each of the plurality of commerce item information feeds comprising a plurality of commerce item information packets that associated with particular commerce items for sale from the distinct online entities;

associating a product identifier with each commerce item information packet, the product identifier reflecting similarities between the commerce items; and

within an aggregate database, storing the commerce item information packets together with the associated product identifiers.

2. The method in Claim 1, wherein:

the step of homogenizing a plurality of commerce item information feeds further comprises the steps of:

parsing each of the plurality of commerce item information feeds to detect distinct commerce information packets within each feed, and

mapping the distinct commerce information packets into the schema for the aggregate database.

3. The method of Claim 1, wherein:

each commerce item information packet comprises a set of commerce item information elements selected from the group of elements consisting of; a price element, an image element, a description element, or a stock keeping unit element.

4. The method of Claim 1, further comprising the steps of;

enabling access, querying, and retrieval of commerce item information from the aggregate database via a user interface; and

recording commerce metrics related to the online activity of commerce item information within the aggregate database.

5. The method of Claim 4, wherein:

online activity of commerce item information consists of an online activity selected from the group consisting of; user queries of the aggregate database retrieving commerce item information and merchant system advertising

initiated queries of the aggregate database to retrieve commerce item information for online advertising purposes.

6. The method in Claim 1, wherein:

the product identifier further comprises a commerce item information tag.

7. The method of Claim 6, wherein:

each commerce item information tag comprises at least a portion that is unique and associated with the online entity originating the commerce item information feed.

8. The method of Claim 6, further comprising:

enabling access, querying, and retrieval of commerce item information from the aggregate database via a user interface; and

recording commerce metrics related to a user retrieval of commerce item information tags from the aggregate database.

9. The method of Claim 8, wherein:

commerce metrics comprises at least one of the metrics selected from the group consisting of; the number user aggregate database queries retrieving the commerce item information associated with the commerce item information tag, the temporal aspects related to User database queries retrieving the commerce item information associated with the commerce item information tag, aggregate database retrievals initiated by the online merchant system for advertisement related purposes.

10. The method of Claim 8, further comprising the steps of:

reporting the commerce metrics to at least the online entity that originated the commerce item information associated with the commerce item information tag.

11. A system for quantizing the effectiveness of advertising using an online merchant system that facilitates commercial transactions involving commerce items, comprising:

a commerce item information receiving system that is accessible by at least one online entity that may interface with the commerce item information system to deliver a data feed comprised of plurality of commerce item information packets that relate to commerce items that can be shopped for by online users

via the online merchant system, the commerce item information receiving system under hardware and software control to,

receive, map and store each commerce item information packet into an aggregate database using a common commerce item information format, and

associate a commerce item information tag to each commerce item information packet stored within the aggregate database; the system for quantizing the effectiveness of advertising also including,

a commerce metric recording system that records commerce metrics reflecting related to the online activity regarding any particular commerce item by recording queries of the aggregate database returning a specific unit of commerce item information and the associated commerce item information tag.

12. The system in Claim 11, wherein:

the reporting system further enables reporting commerce metrics to an online entity selected from the group of entities consisting of; an online service provider or an online vendor.

13. The system of Claim 11, wherein:

commerce metrics comprises at least one of the metrics selected

from the group consisting of; the number user aggregate database queries retrieving the commerce item information associated with the commerce item information tag, the temporal aspects related to User database queries retrieving the commerce item information associated with the commerce item information tag, aggregate database retrievals initiated by the online merchant system for advertisement related purposes.

14. The system of Claim 11, wherein:

the commerce item information tag further comprises a product identifier, the product identifier generated according to a methodology that reflects similarities in commerce item information.

15. The system of Claim 14, wherein:

the methodology for generating product identifiers for association with the commerce item information in the aggregate database generates product identifiers that also reflect the differences in commerce item information.

16. A commerce item information tagging system for use in an online merchant system, the online merchant system including; a system for homogenizing the format of received commerce item information from at least two distinct online entities, an aggregate database for storing the homogenized

commerce item information, and a user interface that accesses the aggregate database for query and retrieval of competitive commerce item information from the online entities and displays it within a user's Web browser window; the commerce item information tagging system comprising;

a mechanism for associating commerce item information tags with the commerce item information received from the distinct online entities; and

the commerce item information tag comprising a unique sequence of elements associated with the online entity that originated the commerce item information.

17. The commerce item information tagging system of Claim 16, wherein:

the commerce item information tag further comprises a product identifier generated according to a methodology that reflects similarities in commerce item information.

18. The commerce item information tagging system of Claim 17, wherein:

the methodology generates product identifiers that also reflect the differences in commerce item information.

19. The commerce item information tagging system of Claim 16, further comprising:

a commerce metric recording system that records each query of the aggregate database retrieving a commerce item information tag.

20. The commerce item information tagging system of Claim 19, wherein:

queries of the aggregate database consist of queries selected from the group consisting of; user initiated aggregate database queries retrieving commerce item information and the associated commerce item information tag, and software initiated aggregate database queries for advertising purposes that retrieve commerce item information and the associated commerce item information tag.

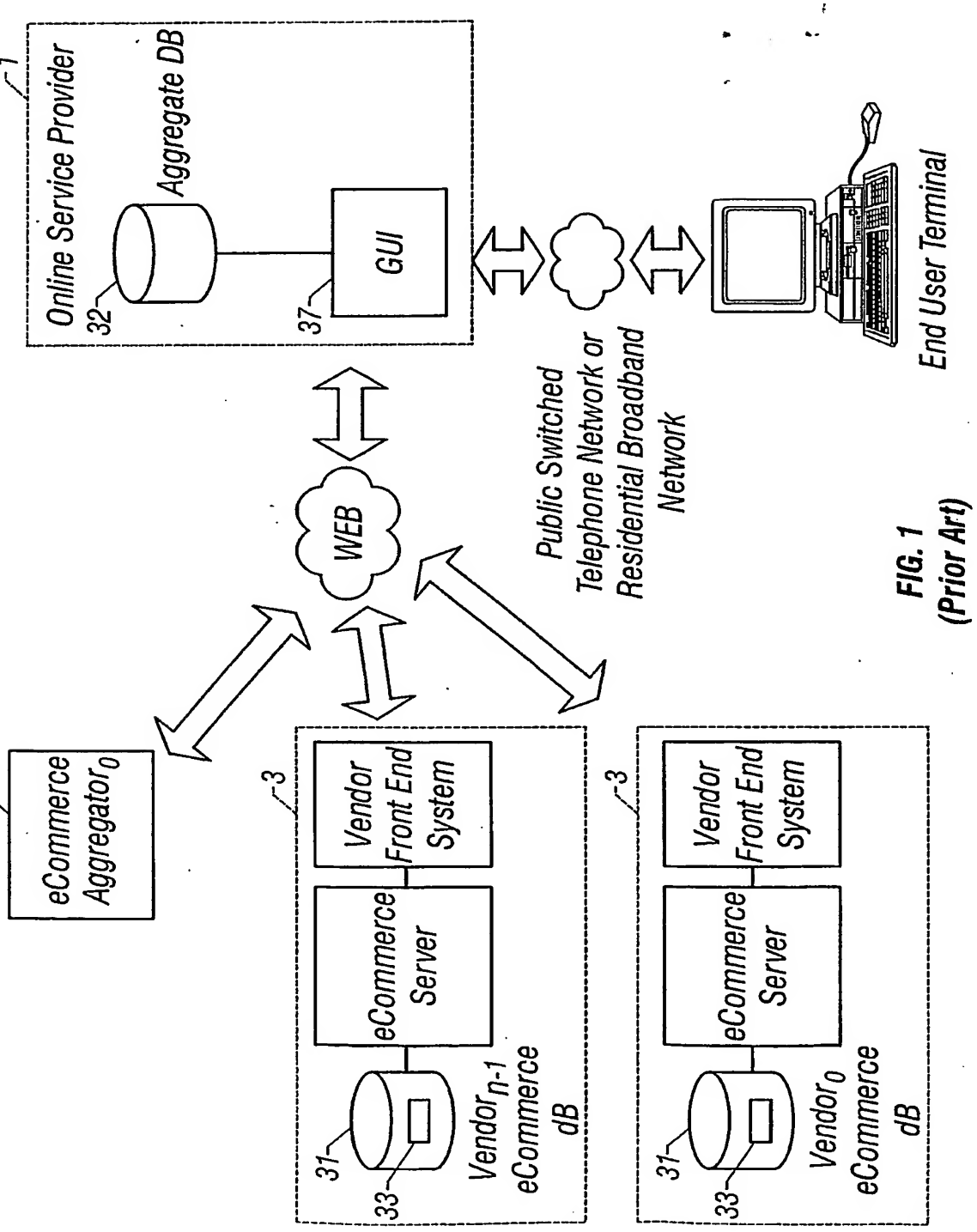

FIG. 1
(Prior Art)

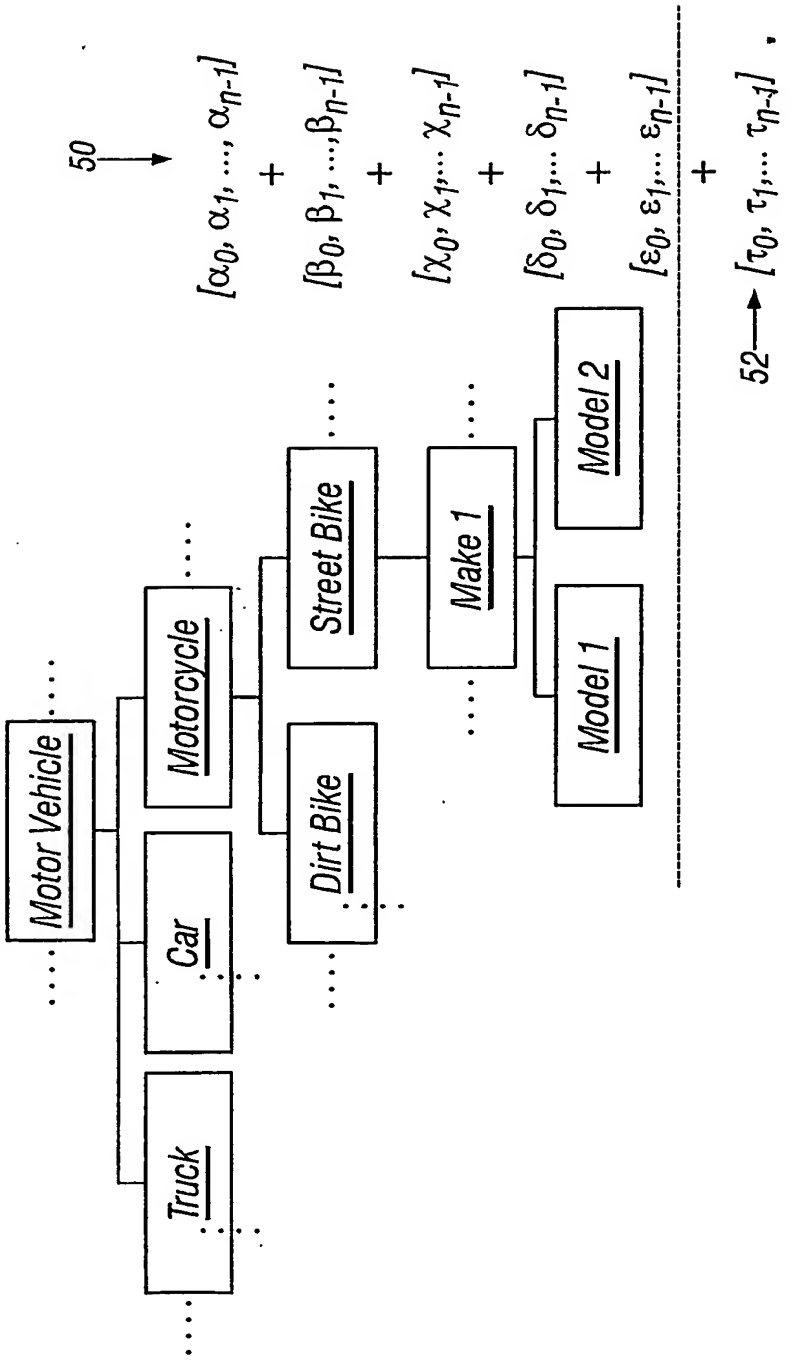
Motor Vehicle
Car
Truck
Motorcycle
Dirt Bike
Street Bike
Make 1
Model 1
Model 2
50
52
[α0, α1, ..., αn-1]
+
[β0, β1, ...,βn-1]
+
[χ0, χ1,... χn-1]
+
[δ0, δ1,... δn-1]
+
[ε0, ε1,... εn-1]
+
[τ0, τ1,... τn-1]

FIG. 2

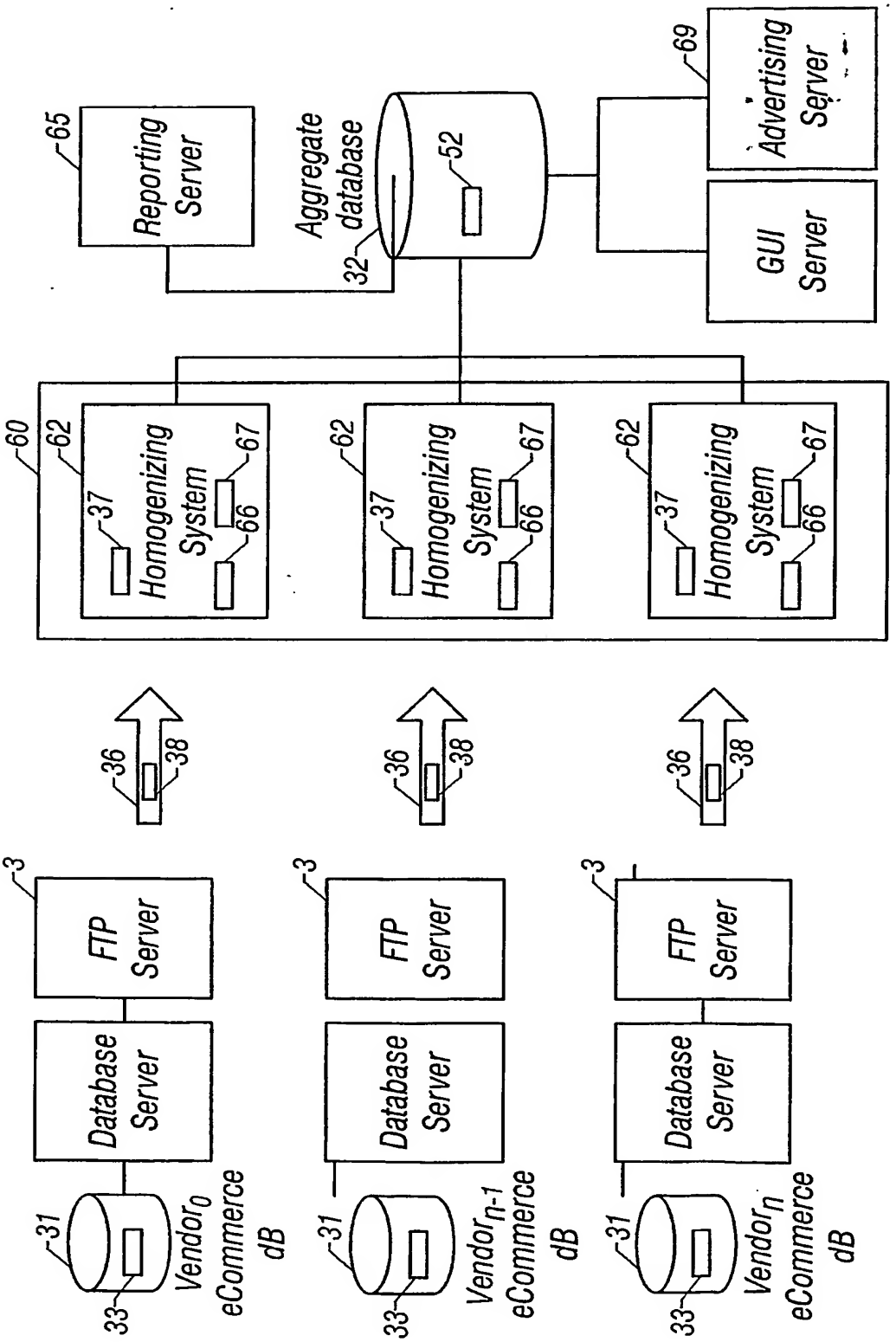
Reporting Server
65
Aggregate database
32
52
Advertising Server
69
GUI Server
60
62
Homogenizing System
37
66
67
36
38
FTP Server
3
Database Server
31
33
Vendor0 eCommerce dB
Vendorn-1 eCommerce dB
Vendorn eCommerce dB

FIG. 3

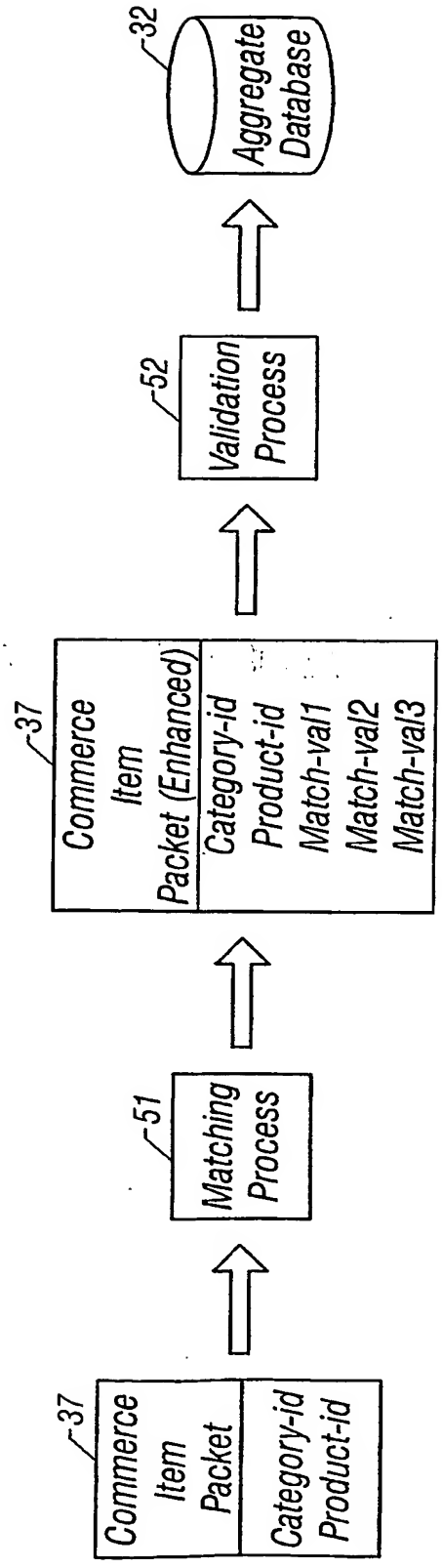
37
Commerce Item Packet
Category-id
Product-id
51
Matching Process
37
Commerce Item Packet (Enhanced)
Category-id
Product-id
Match-val1
Match-val2
Match-val3
52
Validation Process
32
Aggregate Database

FIG. 4